



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/681,687

10/08/2003

William L. Betts

REMB-0031

7710

7590

04/01/2008

Vincent J. Roccia
WOODCOCK WASHBURN LLP
Cira Centre
2929 Arch Street, 12th Floor
Philadelphia, PA 19104-2891

EXAMINER

PANWALKAR, VINEETA S

ART UNIT

PAPER NUMBER

2611

MAIL DATE

DELIVERY MODE

04/01/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/681,687	Applicant(s) BETTS, WILLIAM L.	
	Examiner VINEETA S. PANWALKAR	Art Unit 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 and 16-20 is/are rejected.
- 7) ☒ Claim(s) 15 and 21 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10/08/03 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) ☒ Notice of References Cited (PTO-892) | 4) ☐ Interview Summary (PTO-413) |
| 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) ☐ Information Disclosure Statement(s) (PTO/SB/08) | 5) ☐ Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) ☐ Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 12/12/07 have been fully considered but they are not persuasive.
- 1a. Applicants argue that the steps recited in claims 1, 10 and 12 perform the noise suppression as disclosed in paragraphs [029], [032] and [050]-[053]. However, it is pointed out that although claims are read in light of the specification, the specification is not read into the claims. Although the limitations recited in claims 1, 10 and 12 are responsible for claimed "noise suppression", the bodies of the claims do not reflect how exactly those limitations ascertain that noise is suppressed. Hence, the 35 USC 112, second paragraph rejection of claims 1-15 from the office action mailed 6/13/07 is maintained.
- 1b. Regarding 1, 2, 3, 5, 10-13, 16 -18 and 20, applicant argues that each symbol will be transmitted 12 (N) times and each set of 12 (N) symbols will be transmitted on a different channel. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., claims do not mention that each symbol will be transmitted N times. On the contrary, the claims state that each N-symbol combination is associated with and transmitted on one of a plurality of different channels, implying that each symbol in the N-symbol combination is transmitted once, on one of the plurality of channels and that the next N-symbol combination (not necessarily comprising the same N-symbols as per claim

language) is also transmitted on one of a plurality of channels. Applicant admits that previously cited reference Cimini, Jr. et al. (US 6005876, hereinafter, Cimini) discloses that each antenna (claimed channel) transmits a subset of the total number of tones. The subset is interpreted as being an N-symbol combination, which is transmitted from one antenna i.e. on one of a plurality of channels) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

- 1c. Further, in light of the specification, it appears as if applicant is implying that “N-symbol combinations” are nothing but symbols that have been interleaved. Cimini shows how clusters transmitted by one antenna are interleaved with clusters transmitted by another antenna (Column 4, lines 28-40).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Art Unit: 2611

- 2a. Claim 1 is a communication system for noise suppression. However, it is unclear from the claim language, how the communication system performs claimed noise suppression.
- 2b. Claims 1-9 are rejected under 35 U.S.C. 112, second paragraph, as being dependent on claim 1.
- 2c. Claim 10 is a method for noise suppression. However, the step/s showing how the noise suppression is achieved have not been claimed.
- 2d. Claims 11 is rejected under 35 U.S.C. 112, second paragraph, as being dependent on claim 10.
- 2e. Claim 12 is a communication system for noise suppression. However, it is unclear from the claim language, how the communication system performs claimed noise suppression.
- 2f. Claims 13-15 are rejected under 35 U.S.C. 112, second paragraph, as being dependent on claim 12.
- 2g. Claims 8 and 14 are further rejected under 35 U.S.C. 112, second paragraph, because it is unclear from the claim language, where or how the adaptive algorithms are used.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 2, 3, 5, 10-13, 16 –18 and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Cimini.

- 3a. Regarding claims 1, 10, 12 and 16, Cimini discloses a communication system (the part of the preamble stating that the communication is for noise suppression has not been given patentable weight because it does not breathe life into the body of the claim) comprising:

- first logic configured to combine a time series of input symbols, where the time series has size N and N is greater than one, into a block of N-symbol combinations, where each of the input symbols is taken from a signaling constellation, and wherein each N-symbol combination is associated with one of a plurality of different channels (Fig. Unit 301 outputs claimed time series of input symbols, while 302-304 perform claimed combining into a block of N-symbol combinations and S/P converter 305 and distributor 306 ensure that

the symbols are sent on different channels. Hence blocks 301-306 are together interpreted as claimed first logic. Column 4, lines 1-63 and Fig. 3, wherein different carrier tones in multi-carrier configuration are interpreted as claimed plurality of different channels and clusters transmitted by each antenna (that have been interleaved with clusters transmitted by another antenna) are interpreted as claimed N-symbol combinations (Column 4, lines 28-40)); and

- second logic (Fig. 3, antennas 309₁ - 309_M) configured to transmit each N-symbol combination, on one of the plurality of different channels, to a receiver (Column 4, lines 18-36).

(Regarding claims 10 and 12, Cimini discloses corresponding method and means. Regarding claim 16, Cimini further shows that the system may be implemented as a program in a computer-readable medium (Column 7, lines 1-20, wherein the hardware and DSP are interpreted as being programmed to perform functions of claimed system)).

3b. Regarding claims 2, 11, 13 and 17, Cimini also system shows, further comprising:

- third logic configured to receive a transmitted signal, wherein the transmitted signal includes each N-symbol combination (Fig. 1B, antenna 110, column 3, lines 24- 35. Since each N-symbol combination is transmitted simultaneously

- on different channels (Column 4, lines 15-36), the transmitted signal inherently includes each N-symbol combination);
- and fourth logic configured to combine the block of N-symbol combinations in order to recover the time series of input symbols (Column 3, lines 24 – 40. Receiver of Fig. 1B performs decoding to obtain the transmitted bit stream and is hence interpreted as claimed fourth logic).

(Regarding claims 11 and 13, Cimini discloses corresponding method and means).

- 3c. Regarding claims 3 and 18, Cimini further discloses the communication system wherein each of the N-symbol combination in the block appears simultaneously as an output of the first logic (Column 4, lines 15-36).
- 3d. Regarding claims 5 and 20, Cimini further discloses the communication system wherein the second logic transmits all N-symbol combinations simultaneously (Column 2, lines 47-52).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 4, 6 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cimini in view of Hulyalkar et al. (US 5291298), hereinafter, Hulyalkar.

- 4a. Regarding claims 4 and 19, Cimini discloses all the limitations claimed, but fails to explicitly mention whether each N-symbol combination contains a weighted sample of all of the input symbols.

However, in the same field of endeavor, Hulyalkar shows method and apparatus for transmitting multi-carrier signals wherein each N-symbol combination contains a weighted sample of all of the input symbols (Figs. 4 and column 5, lines 45-65). Thus, it would have been obvious to a person of ordinary skill in the art to use Hulyalkar's method of transmitting weighted multi-carrier symbols because Hulyalkar's method provides greater immunity to noise and interference by distributing the signal among the several carriers which are distributed uniformly throughout the allocated frequency band (Column 2, lines 60-64).

- 4b. Regarding claim 6, Cimini discloses all the limitations claimed, but fails to explicitly mention whether each N-symbol combination contains logic to scale each of the input symbols by a scale factor.

However, in the same field of endeavor, Hulyalkar shows method and apparatus for transmitting multi-carrier signals wherein whether each N-symbol combination contains logic to scale each of the input symbols by a scale factor. (Figs. 4 and

column 5, lines 45-65, wherein weighting is interpreted as claimed scaling and weighting coefficient is interpreted as claimed scale factor).

Thus, it would have been obvious to a person of ordinary skill in the art to use Hulyalkar's method of transmitting scaled multi-carrier symbols because Hulyalkar's method provides greater immunity to noise and interference by distributing the signal among the several carriers which are distributed uniformly throughout the allocated frequency band (Column 2, lines 60-64).

5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cimini in view of Rakib (US 5805583), hereinafter, Rakib.

- 5a. Regarding claim 7, Cimini discloses all the limitations claimed, but fails to explicitly mention whether noise energy present in each of the time series of input symbols is spread among at least one of the N-symbol combinations such that the noise energy is reduced.

However, in the same field of endeavor, Rakib shows system for transmitting data over multiple channels wherein noise energy present in each of the time series of input symbols is spread among at least one of the N-symbol combinations such that the noise energy is reduced (Column 4, lines 34-59).

Thus, it would have been obvious to a person of ordinary skill in the art to use Rakib's method of transmitting data by spreading the noise energy because it achieves high noise immunity (Column 4, lines 34-59).

6. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cimini in view of Heegard et al. (US 6160854), hereinafter, Heegard.
- 6a. Regarding claim 9, Cimini shows all the limitations claimed, but fails to explicitly show claimed de-interleaver.

However, in the same field of endeavor, Heegard shows receiver for block encoded data comprising a de-interleaver to produce de-interleaved reference symbols (Column 5, lines 26-31).

Thus, it would have been obvious to a person of ordinary skill in the art to use de-interleave shown by Heegard in the receiver shown by Cimini because the de-interleaver recovers the original order of encoded data and enables accurate demodulation.

Allowable Subject Matter

7. Claims 15 and 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Double Patenting

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

- 7a. Claims 1, 2, 4, 7, 8, 10, 11, 12, 13, 14, 16, 17 and 19 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 2, 1, 6, 8, 10, 11, 28, 29, 35, 19, 20 and 19 respectively of U.S. Patent No. 6668023 in view of Cimini.

Claims 1, 10, 12 and 16 of instant application are a broader version of claims 1, 10, 28 and 19 of US 6668023, because they do not claim that “said n- output symbols contains a weighted symbol of said n-input symbols”, but could be anticipated based on claims 1, 10, 28 and 19 of US 6668023. Further, although

claims 1, 10, 28 and 19 of US 6668023 do not show "plurality of channels" claimed in claims 1, 10, 12 and 16 of instant application, it would have been obvious to a person of ordinary skill in the art to use Cimini's teaching of transmitting combinations on one of plurality of channels (Column 4, lines 1-63 and Fig. 3, wherein different carrier tones in multi-carrier configuration are interpreted as claimed plurality of different channels).

Contact Information

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vineeta S. Panwalkar whose telephone number is 571-272-8561. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR

Art Unit: 2611

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/V. S. P./

Examiner, Art Unit 2611

/Mohammad H Ghayour/

Supervisory Patent Examiner, Art Unit 2611